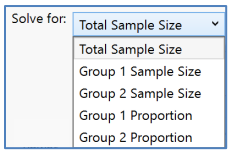
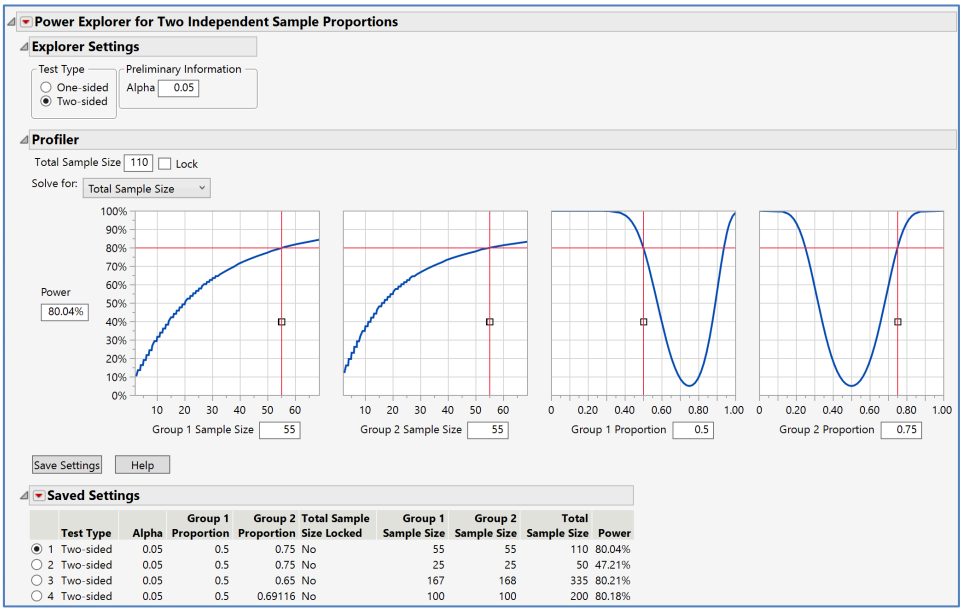
# Sample Size and Power for Two Sample Proportions

Use to interactively explore the relationships between Power, Sample Sizes, and Alternative Proportions in testing a hypothesis comparing two independent population proportions. See the **Two Proportions Test and Confidence Interval** guide to learn how to perform a statistical test comparing two population proportions.

## Sample Size and Power - Two Sample Proportion

1. Select **DOE > Sample Size Explorers** and choose **Power >Power for Two Independent Sample Proportions**.
2. Choose the type of test: **One-Sided** or **Two-Sided** and choose **Alpha** (significance level for the test).
   The Null Hypothesis is that the two proportions are equal. Here we chose a two-sided alternative which is used to test that the two proportions are not equal.
   This null and alternative hypothesis can be written using notation as $H_0$: $p_1 = p_2$ vs. $H_A$: $p_1 \neq p_2$
3. Enter values for the **Group 1** and **Group 2 Population Proportions** under $H_A$ to base the analysis on.
   Here we consider the scenario where **Proportion 1** is 0.50 and **Proportion 2** is 0.75.
4. Select parameter to solve for. Here we chose Total Sample Size.
5. Enter a value for the **Power**. Here we entered 0.80.
   The solution of Total Sample Size of 110 ($n_1$=55 and $n_2$=55) is displayed.
6. Use the interactive cross-hair tool (or type in values) for **Power**, **Sample Sizes**, and **Assumed Proportions** to study the relationship between these parameters solving for many different scenarios.




Note: Determining sample size to achieve a desired margin of error in a Confidence Interval can be done using **DOE > Sample Size Explorers > Confidence Intervals > Margin of Error for Two Independent Sample Proportions**.

The settings and solution for each analysis performed can be saved. The table of saved settings shows the results of five different analyses performed when testing the hypothesis $H_0$: $p_1 = p_2$ vs. $H_A$: $p_1 \neq p_2$

1. What sample size is needed to achieve a power of 80% assuming $p_1$=0.50 and $p_2$=0.75?
   *Answer: 110 ($n_1$ = 55 and $n_2$ = 55)*
2. What is the power with a sample size of 25 in each group assuming $p_1$=0.50 and $p_2$=0.75? *Answer: Power = 47.2%*
3. What sample size is needed to achieve a power of 80% assuming $p_1$=0.50 and $p_2$=0.65?
   *Answer: 335 ($n_1$ = 167 and $n_2$ = 168)*
4. What difference from 0.50 for the proportion of group 2 can be detected with 80% power using a sample size of 100 in each group?
   *Answer: 0.69*

Visit **Design of Experiments Guide > Sample Size Explorers** in **JMP Help** to learn more.